WHAT IS CLAIMED IS:

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1. An MR (MagnetoResistance effect) head comprising:

a slider; and

a film structure part which is located on an air outflow side of the slider and includes an MR element for reproducing,

the film structure part having an end surface located on an identical side as a floating surface of the slider,

the end surface of the film structure part and the floating surface of the slider forming a step-like recess which has a depth making it possible to prevent a fine projection on a magnetic disk from hitting the end surface of the film structure part.

2. The MR head as claimed in claim 1, wherein the depth of the step-like recess causes an end of the MR element on the end surface of the film structure part to be located on or above an imaginary line which passes through a rear edge of the slider and said end of the MR head when the MR head is in a floating state at a given angle.

3. The MR head as claimed in claim 1, wherein:

the depth of the step-like recess has a

length equal to or greater than a sum of a first length and a second length;

the first length causes an end of the MR element on the end surface of the film structure part to be located on an imaginary line which passes through a read edge of the slider that is in a floating state at a given angle and which is parallel to the magnetic disk; and

the second length corresponds to a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed.

4. The MR head as claimed in claim 1, wherein:

the depth of the step-like recess has a length equal to or greater than a sum of a first length and a second length;

the first length causes an end of the MR element on the end surface of the film structure part to be located on an imaginary line which passes through a read edge of the slider that is in a floating state at a given angle and which is parallel to the magnetic disk; and

the second length corresponds to a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

5. The MR head as claimed in claim 1,

wherein:

the depth of the step-like recess has a length equal to or greater than a sum of a first length, a second length, and a third length;

the first length causes an end of the MR element on the end surface of the film structure part to be located on an imaginary line which passes through a read edge of the slider that is in a floating state at a given angle and which is parallel to the magnetic disk;

the second length corresponds to a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed; and

the third length corresponds to a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

6. The MR head as claimed in claim 1, wherein the depth of the step-like recess satisfies the following condition:

$$Y1 \geq t1 \times \tan\alpha$$

where Y1 is the depth of the step-like recess, t1 is a distance between an air outflow end of the slider and the MR element, and α is the floating angle.

7. The MR head as claimed in claim 1, wherein the depth of the step-like recess satisfies

the following condition:

$$Y3 \geq (t1 \times \tan\alpha) + Nh$$

where Y3 is the depth of the step-like recess, t1 is a distance between an air outflow end of the slider and the MR element, α is the floating angle, and Nh is a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed.

8. The MR head as claimed in claim 1, wherein the depth of the step-like recess satisfies the following condition:

$$Y4 \geq (t1 \times \tan\alpha) + Z$$

where Y4 is the depth of the step-like recess, t1 is a distance between an air outflow end of the slider and the MR element, α is the floating angle, and Z is a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

9. The MR head as claimed in claim 1, wherein the depth of the step-like recess satisfies the following condition:

$$Y5 \geq (t1 \times \tan\alpha) + Nh + Z$$

where Y5 is the depth of the step-like recess, t1 is a distance between an air outflow end of the slider and the MR element, α is the floating angle, Nh is a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed, and Z is a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

10. An MR (MagnetoResistance effect) head comprising:

a slider; and

a film structure part which is located on an air outflow side of the slider and includes an MR element for reproducing,

the film structure part having an end surface located on an identical side as a floating surface of the slider,

the end surface of the film structure part and the floating surface of the slider forming a step-like recess which has a depth making it possible to prevent a fine projection on a magnetic disk from hitting the end surface of the film structure part, and causes a first rear edge of the film structure part to be located on or above an imaginary line which passes through the first rear edge of the film structure part and a second rear edge of the slider when the MR head is in a floating state at a given angle.

11. The MR head as claimed in claim 10, wherein the depth of the step-like recess satisfies the following condition:

$$Y2 \geq t2 \times \tan\alpha$$

where Y2 is the depth of the step-like recess, t2 is a thickness of the film structure part, and α is the floating angle.

12. The MR head as claimed in claim 10, wherein the depth of the step-like recess satisfies the following condition:

$$Y3' \geq (t2 \times \tan\alpha) + Nh$$

where Y3' is the depth of the step-like recess, t2 is a thickness of the film structure part, α is the floating angle, and Nh is a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed.

13. The MR head as claimed in claim 10, wherein the depth of the step-like recess satisfies the following condition:

$$Y4' \geq (t2 \times \tan\alpha) + Z$$

where Y4' is the depth of the step-like recess, t2 is a thickness of the film structure part, α is the

floating angle, and Z is a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

14. The MR head as claimed in claim 10, wherein the depth of the step-like recess satisfies the following condition:

$$Y5' \geq (t2 \times \tan\alpha) + Nh + Z$$

where Y5' is the depth of the step-like recess, t2 is a thickness of the film structure part, α is the floating angle, Nh is a magnitude of a swelling of the end surface of the film structure part, said swelling being formed when the film structure part is thermally deformed, and Z is a descending movement of the MR head after the MR head is pushed upwardly by the fine projection, said descending movement including an overshooting movement.

15. A magnetic disk apparatus comprising:

a magnetic disk;

an MR (MagnetoResistance effect) head; and

a supporting member which movably supports the MR head above the magnetic disk,

said MR head comprising:

a slider; and

a film structure part which is located on an air outflow side of the slider and includes an MR element for reproducing,

the film structure part having an end surface located on an identical side as a floating surface of the slider,

the end surface of the film structure part and the floating surface of the slider forming a step-like recess which has a depth making it possible to prevent a fine projection on a magnetic disk from hitting the end surface of the film structure part.

16. The magnetic disk apparatus as claimed in claim 15, wherein:

the supporting member comprises a suspension to which the MR head is fixed, and patterned wiring lines formed on the suspension; and

ball members which are made of an electrically conductive material and connect terminals of the MR head and the patterned wiring lines.

17. A magnetic disk apparatus comprising:

a magnetic disk;

an MR (MagnetoResistance effect) head; and

a supporting member which movably supports the MR head above the magnetic disk,

said MR head comprising:

a slider; and

a film structure part which is located on an air outflow side of the slider and includes an MR element for reproducing,

the film structure part having an end surface located on an identical side as a floating surface of the slider,

the end surface of the film structure part and the floating surface of the slider forming a step-like recess which has a depth making it possible to prevent a fine projection on a magnetic disk from hitting the end surface of the film structure part, and causes a first rear edge of the film structure part to be located on or above an imaginary line which passes through the first rear edge of the film structure part and a second rear edge of the slider when the MR head is in a floating state at a given angle.

18. The magnetic disk apparatus as claimed in claim 17, wherein:

the supporting member comprises a suspension to which the MR head is fixed, and patterned wiring lines formed on the suspension; and

ball members which are made of an electrically conductive material and connect terminals of the MR head and the patterned wiring lines.

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